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Two New Species of the Genus *Riukiaria* from Kyûshû and Is. Yaku-shima, Japan (Diplopoda : Polydesmida : Xystodesmidae)

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田辺　力[1]：九州および屋久島産*Riukiaria*（アマビコヤスデ）属の2新種
（倍脚綱：オビヤスデ目：ババヤスデ科）

Abstract : Two new species of Japanese Xystodesmidae, *Riukiaria anachoreta* n. sp. (southern Kyûshû) and *R. puella* n. sp. (Is. Yaku-shima), are described and figured based on male and female adults.

The genus *Riukiaria* is distributed in the Far East, and up to the present 18 species are known from Japan, Korea and Taiwan (Shinohara, 1977). Although the Japanese forms have been studied by several authors (Pocock, 1895; Verhoeff, 1936; Takakuwa, 1941, 1942; Miyoshi, 1952, 1957; Jeekel, 1952; Wang, 1956, 1957; Haga, 1968; Shinohara, 1977), details of their distributions and geographic variations are still poorly understood. In the course of my systematic study of the Japanese xystodesmids, I have found several new forms mainly from central and southern parts of Japan (Honshû, Shikoku, Kyûsyû, and Is. Yaku-shima). In this paper I describe two new species of this genus from southern Kyûshû and Is. Yaku-shima, off the southern coast of Kyûshû.

Terminology follows that of Shelley (1981) except for the parts of acropodite.

Riukiaria anachoreta Tanabe, n. sp.

(Figs. 1−10)

Holotype : Male, from Yoshimizu, Yoshida-chô, Kagoshima-gun, Kagoshima-ken, Kyûshû, 4-IV-1987, T. Tanabe leg. The holotype will be deposited in the collection of the National Science Museum, Tokyo.

Paratypes: 3 males, 12 femmales, data as above; 6 males, 1 female, locality as above,

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27-X-1987, T.TANABE leg. Paratypes will be deposited in the collection of the National Science Museum, Tokyo, and the collection of the North Carolina State Museum of Natural History, Raleigh, USA, and my private collection.

Other specimens examined: 1 male, locality as above, 4-IV-1987, T. TANABE leg.; 1 male, locality as above, 2-XI-1986, T. KUMASHIRO leg.

Diagnosis : This species is similar to *R. cornuta* (HAGA) from Kyûshû in most of the structural characters. but differs from the latter in the shorter prefemoral process directed dorsad, more fragile acropodite without tooth, and uniformly greenish gray colored metatergites.

A moderate size species of *Riukiaria*. Metatergites with tubercles. Gonopod with the following diagnostic characters: Prefemoral process short and sinuate, directed dorsad toward body; acropodite fragile and simple, extending beyond level of prefemoral process, with inner surface twisted at about 2/3 length, curved near tip, flattened from twisted portion to tip; tip simple.

Holotype: Length about 39 mm, maximum width 6.6 mm, W/L ratio about 17%, depth/width ratio 68.2%. Segmental widths as follows:

Collum	4.5mm	6th-11th	6.4	15th	6.3
2nd	5.8	12th	6.5	16th	6.2
3rd-4th	6.1	13th	6.6	17th	5.6
5th	6.3	14th	6.4	18th	4.5

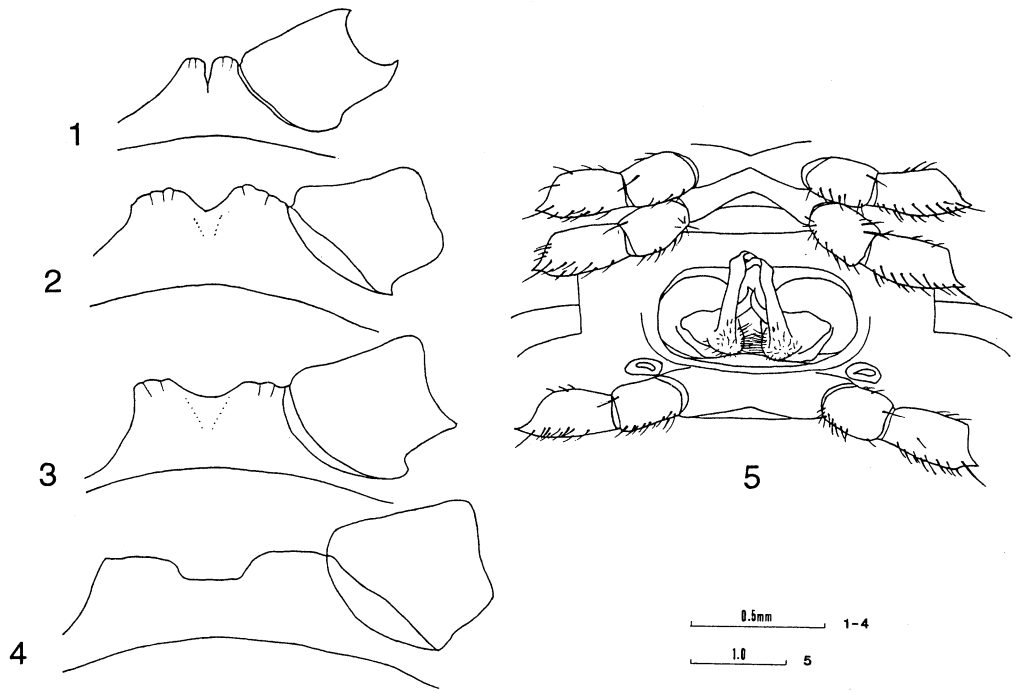
Color in life: Metatergites greenish gray with yellowish white, transverse stripes along anterior margins; protergites greenish gray, with yellowish white, transverse stripes along posterior margins expect median areas; collum greenish gray without markings; epicranium pale greenish gray; frons greenish gray; genae and clypeus yellowish white; labrum yellowish white in basal half and amber in apical half; antennae yellowish white; venter yellowith white; legs yellowish white; claws amber.

Head capsule smooth; width across genal apices 4.2 mm; interantennal isthmus 1.4 mm; epicranial suture distinct. Antennae relatively short, reaching back to middle of paranota of 3rd tergite and becoming progressively more hirsute distally; first antennomere subglobose, 2nd-6th clavate, 7th short and truncate; relative lengths of antennomeres 2=3=4=5=6>1>7. Genae not margined laterally, each with distinct central impression; lateral margins broadly rounded and projecting slightly beyond adjacent margins of cranium. Facial setae as follows : Epicranial 2-2; interantennal 1-1; frontal and genal about 75; clypeal about 40; labral about 30.

Collum with a row of small tubercles along caudal margin, L/W ratio 42.4%; lateral margins somewhat narrower than those of 2nd tergite. Protergites smooth. Metatergites granulate, with 3 transverse rows of small tubercles on segments 2-18; 3rd row obscure and

located along caudal edge; anterior row located in front of broad indistinct transverse depression; 10th tergite with about 30 tubercles in total. Paranota moderately depressed, angling ventrad and continuing slope of dorsum; anterior corners of paranota rounded; caudolateral corners blunt on segments 1-4, becoming progressively more acute caudally. Peritremata distinctly elevated above paranotal surface. Ozopores located caudal to midlength, opening dorsolaterad.

Sides of metazonites arcuate. Strictures distinct. Sternite of segment 4 with two small, narrowly segregated lobes between 3rd legs (Fig. 1); that of segment 5 with two short,



Figs. 1-5 *Riukiaria anachoreta* n. sp. 1-4, Lobes of 4th-7th sternites of holotype (1-2 and 4, posterior view. 3, anterior view; 1, 4th. 2, 5th. 3, 6th. 4, 7th). 5, Gonopods *in situ*, ventral view, of a paratype.

broad, widely separated lobes between 4th and 5th legs (Figs. 2-3); that of segment 6 with two broad, flat, elevated areas between 6th legs (Fig. 4), and deeply, convexly recessed between 7th legs to accommodate curvature of telepodite. Postgonopodal sternites with small acute process adjacent to each coxa, with shallow transverse groove originating between leg paris; sternal surface smooth, without setae. Pregonopodal legs densely hirsute; postgonopodal legs becoming progressively less hirsute caudally. Coxae without spines; prefemoral spines beginning on segment 4, becoming progressively longer and more pointed caudally; claws hooked. Hypoproct rounded: paraprocts with margins strongly thickened.

Gonopodal aperture elliptical, 2.1 mm wide and 1.1 mm long at midpoint; sides raised above metazonal surface. Gonopods *in situ* (Fig. 5, not this specimen) with acropodites overlapping in midline and projecting forward beyond aperture. Gonopod structure as follows (Figs. 6-8): Coxa with one macroseta. Prefemur produced laterad, roundly flattened at base. Prefemoral process arising on anterior side, short, sinuate, tapering into acuminate tip, directed toward body. Acropodite thin, fragile, simple; arch leaning anteromediad, extending beyond level of prefemoral process, with inner surface twisted at about 2/3 length, curved near tip, flattened from twisted portion to tip; tip simple. Prostatic groove originating in pit at base of prefemur, running along inner surface of acropodite, crossing to lateral surface at twisted portion and continuing to terminal opening.

Male paratypes: The male paratypes agree with the holotype in most features.

Female paratypes: Length about 45 mm, maximum width 7.9 mm, W/L ratio about 18%, depth/width ratio 67.1% (one specimen examined for measurements). Agreeing closely with males in somatic features except paranota more strongly depressed, creating appearance of more highly arched body, and legs more fragile.

Cyphopodal aperture broad, encircling 2nd legs. Cyphopod *in situ* with opening of valves visible in aperture. Cyphopod structure as follows (Figs. 9, 10): Receptacle cupped around base of valves, hirsute in apical half. Valves subequal in size, hirsute in apical half.

Distribution: Known only from the type locality.

Remarks: Metatergal tubercles also occur in such Japanese xystodesmid millipeds as *R. semicircularis semicircularis* (T$_{AKAKUWA}$), *R. diacantha* (M$_{IYOSI}$),and some species of *Xystodesmus*.

The present specimems were collected under thick litter of *Cryptomeria japonica*, in association with a related species, *R. cornuta*. The sympatric occurrence of more than one species is rare in Japanese Xystodesmidae.

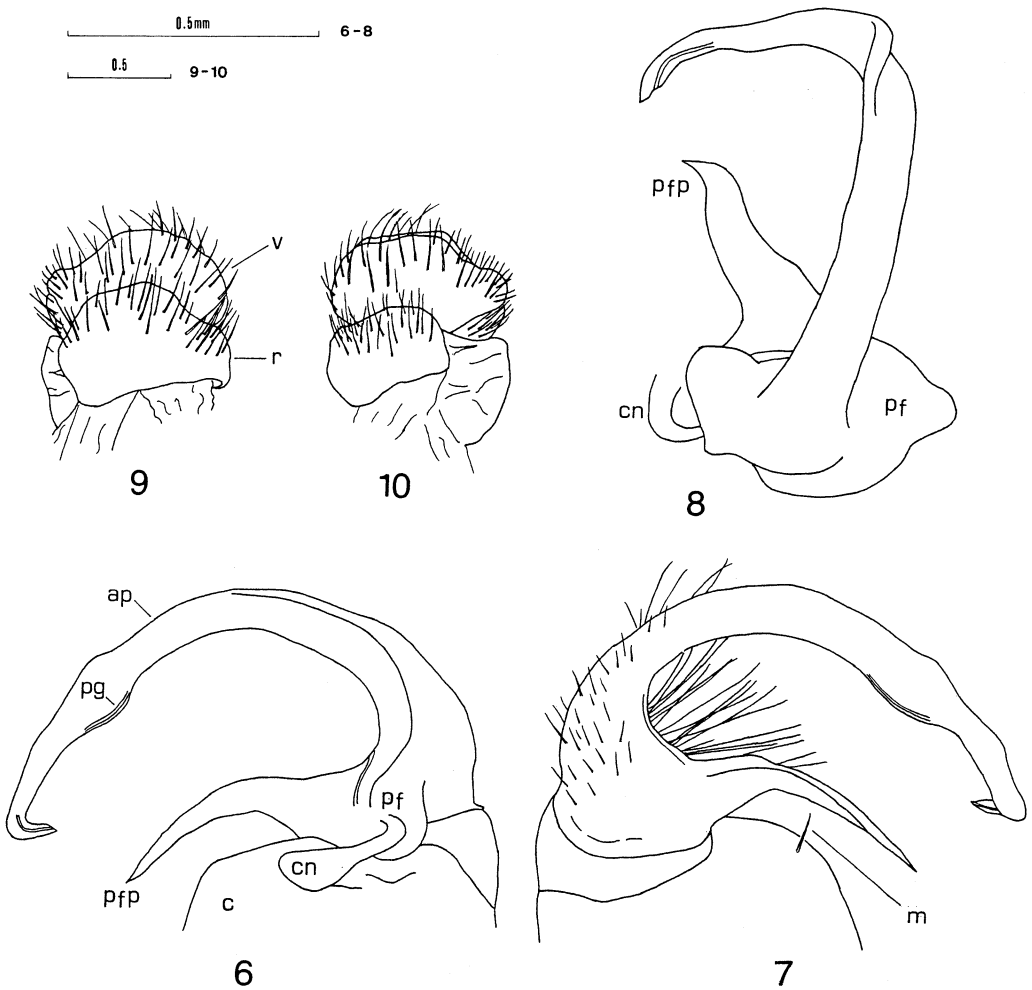
***Riukiaria puella* T$_{ANABE}$, n. sp.**

(Figs. 11-12)

Holotype: Male, along Seibu-rindô, 180 m, alt., 16.6 km N Kurio-bashi, Kami-yaku-chô, Is. Yaku-shima, Kumage-gun, Kagoshima-ken, 11-V-1987, T. T$_{ANABE}$ leg. The holotype will be deposited in the collection of the National Science Museum, Tokyo.

Paratypes : 33 males, 18 females, data as above. Paratypes will be deposited in the collection of the National Science Museum, Tokyo, of the National Museum of Natural History, Smithsonian Institution, Washington. DC, USA,and of the Noth Carolina State Museum of Natiural History, Raleigh, USA, and in my private collection.

Other specimens examined: 1 male, along Hanayama-hodô, 950 m, alt., 26-IV-1986; 1 male, 1330 m, alt.; 1 female, 1500 m, alt.; 1 female, along Ôkabu-hodô, 1120 m, alt., 28-VII-1986; 1 male, 1 female, 1320 m, alt.; 1 female near Takatsuka-goya, 1380 m, alt., 30-



Figs. 6-10 *Riukiaria anachoreta* n. sp. 6, Left gonopod of holotype, setae omitted, medial view. 7, The same, lateral view. 8, Telopodite of left gonopod of holotype, setae omitted, ventral view. 9, Cyphopod of a female, anterior view. 10, The same, posterior view. r, receptacle; v, valve; ap, acropodite; pg, prostatic groove; pf, prefemur; pfp, prefemoral process; cn, cannula; c, coxa; m, macroseta.

VII-1986; 2 males, Nagata, 390 m, alt., Kamiyaku-chô, 15-VIII-1986. (All collected on Is. Yaku-shima by A. MOROTO.)

Diagnosis : This species is similar to *R. holstill* (POCOCK) from Is. Okinawa-jima in most of the structural characters, but differs from the latter in its smaller size, much smaller prefemoral process, and yellow colored tergites.

A small species of *Riukiaria* with yellow tergites; gonopod with the following diagnostic characters: Prefemoral process short, spatulate, directed anteromediad; acropodite

moderately thick, extending well beyond level of prefemoral process, with inner surface twisted at about 2/3 length, curved near tip, flattened from twisted portion to tip, with flange of variable size (often lost as in the holotype) at about midlength on medial face; tip simple.

Holotype : Length about 32 mm, maximun width 5.7 mm, W/L ratio about 18%, depth/width ratio 57.0%. Segmental widths as follows:

Collum	4.9mm	6th-11th	5.7	16th	5.2
2nd	5.2	12th	5.6	17th	4.7
3rd	5.4	13th-14th	5.5	18th	3.8
4th-5th	5.6	15th	5.4		

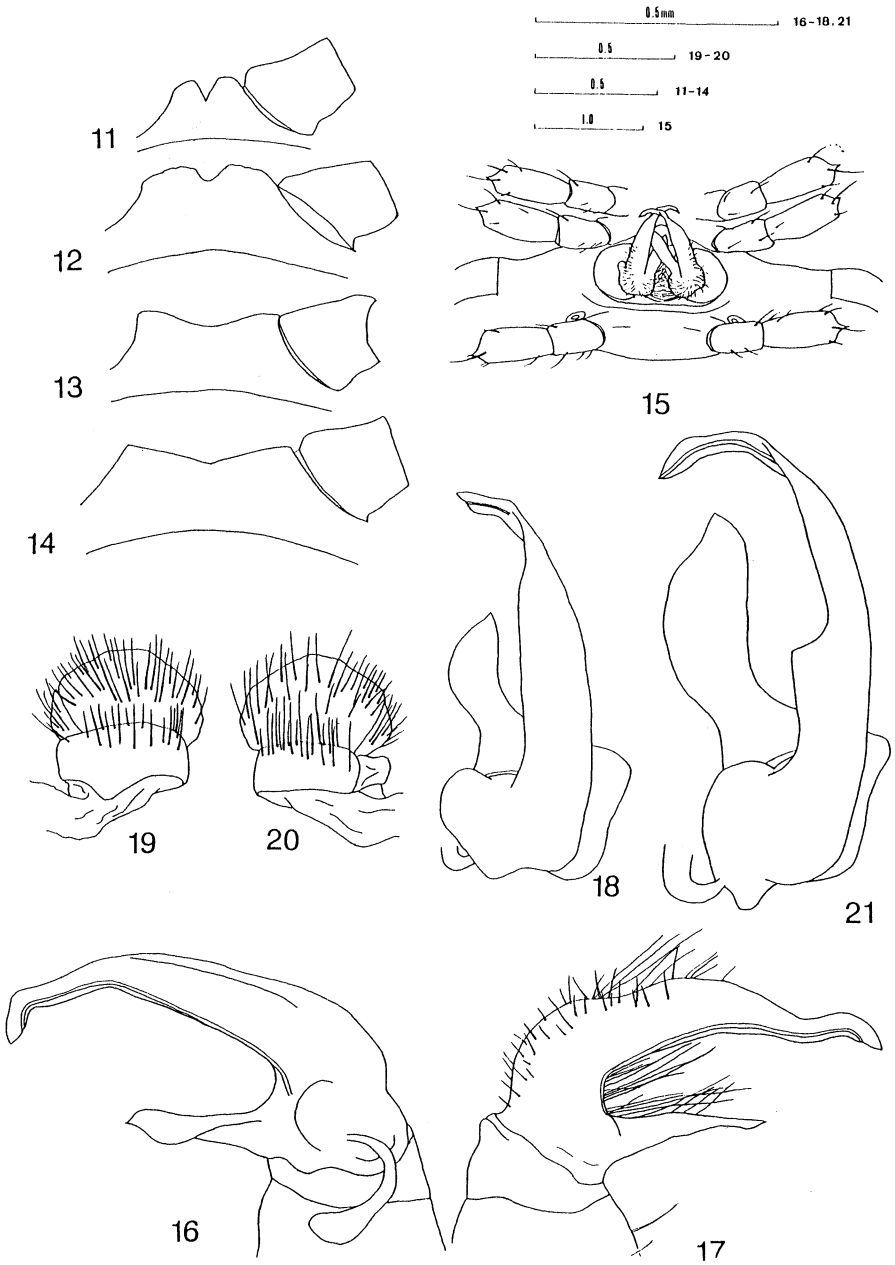
Color in life : Metatergites lemon yellow, darker on paranota, with faint, brown transverse stripes along posterior margins; protergites yellowish white, with faint, brown transverse stripes along posterior margins; collum pale brown medially, lemon yellow on both anterior and posterior margins; epicranium pale brown; frons brown; genae and clypeus yellowish white; labrum yellowish white in basal half and amber in apical half; antennae yellowish white; venter yellowish white; legs yellowish white; claws amber.

Width across genal apices 3.3 mm; interantennal isthmus 1.2 mm. Antennae relatively long, reaching back to middle of paranota of 4th tergite; relative lengths of antennomeres 2=3=4=5=6>1>7. Genae each with distinct central impression; lateral margins broadly rounded. Facial setae as follows: Epicranial 2-2; interantennal 1-1; frontal and genal 25; clypeal about 40; labral about 35.

Collum without tubercules, L/W ratio 39.6%; lateral margins slightly narrower than those of 2nd tergite. Paranota moderately depressed; caudolateral corners blunt through segment 4, and becoming progressively more acute and projecting caudally.

Sternite of segment 4 with two small segregated lobes between 3rd legs (Fig. 11); that of segment 5 with two short, broad, separated lobes between 4th legs (Fig. 12), gradually sloping between 5th legs (Fig. 13); that of segment 6 as in segment 5, but with slopes nearly straight (Fig. 14), and deeply, convexly recessed between 7th legs to accomodate curvature of telopodite. Postgonopodal sternites with small, somewhat acute process adjacent to each coxa. Prefemoral spines beginning on segment 4,becoming progressively longer and more pointed caudally.

Gonopodal aperture elliptical, 1.4 mm wide and 0.7 mm long at midpoint. Sides raised above metazonal surface. Gonopods *in situ* (Fig. 15, not this specimen) with acropodites overlapping in midline and projecting forward beyond aperture. Gonopod structure as follows (Figs. 16-18): Coxa with 2 macrosetae. Prefemur produced laterad, roundly flattened at base. Prefemoral process flattened, spatulate, directed anteromediad. Acropodite moderately thick, extending well beyond level of prefemoral process; arch



Figs. 11-21 *Riukiaria puella* n. sp. 11-14, Lobes of 4-7th sternites of holotype (11-12 and 14, posterior view. 13, anterior view; 11, 4th. 12, 5th. 13, 6th. 14, 7th). 15, Gonopods *in situ,* ventral view, of a paratype. 16, Left gonopod of holotype, setae omitted, medial view. 17, The same, lateral view. 18, Telopodite of left gonopod of holotype. setae omitted, ventral view. 19, Cyphopod of a female, anterior view. 20, The same, posterior view. 21, Telopodite of left gonopod of a specimen from Hanayama-hodô, setae omitted, ventral view.

leaning anteromediad, with inner surface twisted at about 2/3 length, curved near tip, flattened from twisted portion to tip; tip simple.

Male paratypes: The male paratypes vary in body dimentions as shown in Table 1. Gonopod somewhat varies in proportion among specimens. Brown stripes on tergites absent in sevaral individuals.

Table 1 Head width and 10th tergal width in *Riukiaria puella* n. sp., ♂.

Locality	Head width (mm)	10th tergal with (mm)
Nagata, (n=2)	3.3-3.4	5.5-5.8
Hanayama, 950m, alt. (n=1)	4.4	6.9
——— , 1330m, alt. (n=1)	3.7	6.2
Ôkabu, 1320m, alt. (n=1)	3.4	5.4
Type locality (paratypes) (n=20)	2.8-3.5	4.5-5.6

Female paratypes: Length about 29 mm, maximum width 5.9 mm, W/L ratio about 20%, depth/width ratio 71.2% (one specimen examined for measurements). Agreeing with males in somatic features except paranota more strongly depressed, creating appearance of more highly arched body, and legs more fragile.

Cyphopod *in situ* with opening of valves visible in aperture. Cyphopod structure as follows (Figs. 19, 20): Receptacle cupped around base of valves, projecting at middle of dorsal margin on anterior side, apically hirsute. Valves subequal in size, hirsute in apical half.

Variation : Body dimention (Table 1) and shape of dorsum vary in both sexes. In the specimens from Hanayama-hodô, (950 m, 1330 m, 1500 m, alt.) and Ôkabu-hodô (1320 m, alt.), the sides of paranota are more rounded and the caudolateral corners less projecting than in the holotype. In the male specimens from Hanayama-hodô (950 m, alt. -Fig. 21, and 1330 m, alt.) and Ôkabu-hodô (1320 m, alt.), the acropodite possesses are large, angled flange at about midlength on medial face, and the prefemoral process is more expanded than in the holotype. In one male specimen from Hanayama-hodô (950 m, alt.), the stripes on protergites are well defined; metatergites have brown transverse stripes along anterior margins; stripes along posterior margins of metatergites are absent.

Distribution : Is. Yaku-shima, off the southern coast of Kyûshû.

Remarks: The present specimens were collected with *Xystodesmus* sp.

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摘　　要

九州および屋久島より得られた標本に基づき，2新種*Riukiaria anachoreta*(コケイロアマビコヤスデ)と*Riukiaria puella*(キイロアマビコヤスデ)を記載した。前者は，その大型かつ灰緑色の体と♂生殖肢の形態により，後者は，その小型かつ黄色の体と♂生殖肢の形態により，それぞれ近縁種と区別できる。

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